Available Online at http://www.journalajst.com

ASIAN JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN: 0976-3376

Asian Journal of Science and Technology
Vol. 11, Issue, 05, pp.10975-10977, May, 2020

RESEARCH ARTICLE

ECOLOGICAL STUDY OF ROTIFERS FROM KOLAR RIVER, SAONER, DIST. NAGPUR (M.S.), INDIA

***Watkar, A.M.**

Dept. of Zoology, Bhalerao Science College, Saoner, Nagpur, India

ARTICLE INFO

Article History:
Received 07th February, 2020
Received in revised form
19th March, 2020
Accepted 14th April, 2020
Published online 30th May, 2020

Key words:

Kolar river, Fresh water rotifers,
Saoner.

ABSTRACT

In the present study, water samples from 1 station of Kolar river were analysed for seasonal fluctuation of physico-chemical parameters i.e., temperature, DO, BOD, total hardness, pH, alkalinity, TDS and. Effect of physico-chemical parameters on surface water density of rotifers was also studied. During one year study 13 species of rotifers were recognised from June 2011 to May 2012.Maximum population density belongs to Branchionus species. The higher concentration of rotifers was found during winter season and minimum during rainy season. An inverse relationship between the population density rotifer and the water current as well as direct relationship between the water temperature and the population density of rotifers was observed in sampling station throughout the study period.

Citation: Watkar, A.M. 2020. "Ecological study of rotifers from Kolar River, Saoner, Dist. Nagpur (M.S.), India", *Asian Journal of Science and Technology*, 11, (05), 10975-10977.

INTRODUCTION

Adequate knowledge of zooplankton communities and their population dynamics is a major requirement for better understanding of life processes in a freshwater body since eutrophication influences both the composition and productivity of zooplanktons (Bhora and Kumar, 2004). Zooplanktons have long been used as indicators of the eutrophication (Webber *et al.,* 2005; Aoyagui and Bonecker, 2004, Ayodele and Adeniyi, 2006 and Contreras *et al.,* 2009). Zooplankton density has also been reported to vary depending on the availability of nutrients and the stability of the water (Redmond, 2008). Equally, results of several studies have shown that physical and chemical condition of aquatic ecosystems determine the occurrence, diversity and density of both flora and fauna in any given habitat, which may change with season of the year. Zooplanktons are often an important link in the transformation of energy from producers to consumers, due to their large density, shorter life span, drifting nature, high group or species diversity and different tolerance to the stress. Zooplankton is being used as indicator organisms for the physical, chemical and biological process in the aquatic ecosystem. Pawar and Sharma (2001) stated that the species richness and evenness were inversely related to the zooplankton biomass.

MATERIAL AND METHODS

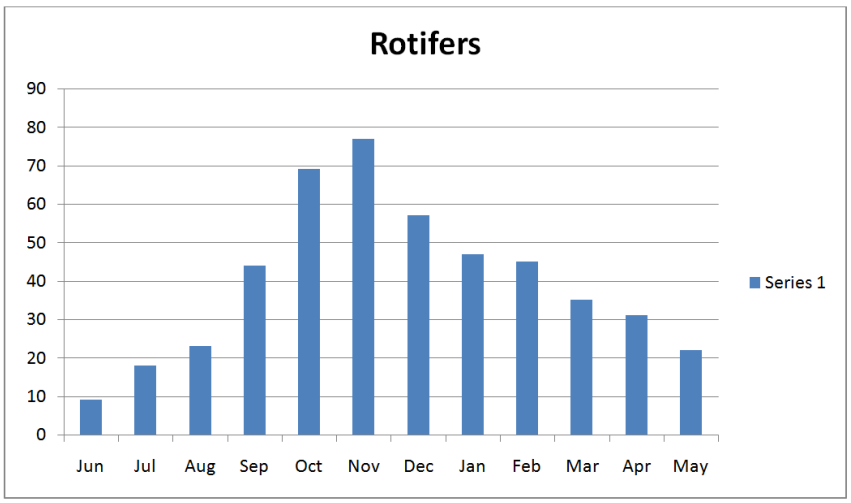
Zooplankton, the microscopic free swimming animal components of aquatic systems, are represented by a wide array of taxonomic groups communities of zooplanktons are studied by estimating the appropriate quantity of samples. For enumeration of zooplanktons 50 litre of water sample was filtered through plankton net made of bolting silk cloth No. 25 with mesh size 63µm and 30 cm diameter. The samples were preserved by adding 2ml of 4% formalin. The quantitative analysis of zooplankton was done by using Sedgwick-Rafter counting cell was used to implement the technique delineated by Welch (1948). Zooplankton examined under binocular microscope with different magnification. All the zooplankton in the counting chamber was observed and identified using various standard keys (Dhanapathi 2000 and Altaf 2004). The no of organism was expressed in units/1 using the formula. Station 'S-1' is located at 15 kilometers upstream from the Saoner town, at village Salai. This station is considered to be pollution free, as no significant source of pollution is observed.

RESULT AND DISCUSSION

Zooplankton constitutes an important link in food chain as grazers (primary and secondary consumers) and serves as food for fishes directly or indirectly. Therefore any adverse effect to them will be indicated in the wealth of the fish populations. Thus, monitoring them as biological indicators of pollution could act as a forewarning for the fisheries particularly when the pollution affects the food chain. Thus, the use of zooplankton for ecological biomonitoring of the water bodies helps in the analysis of water quality trends, development of cause-effect relationships between water quality and environmental data and judgement of the adequacy of water

Table 1. Population Density of Rotifers (Monthly Variation) of Kolar river during June 2011- May 2012 (Units/l)

Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
09	18	23	44	69	77	57	47	45	35	31	22

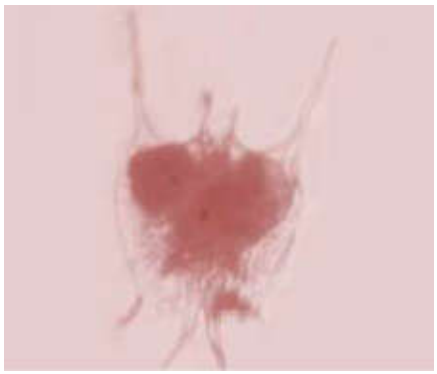


Graph 1.

Table 2. Seasonal Mean value of Rotifers of Kolar riverduring June 2011- May 2012 (Units/l)

Monsoon		Winter		Summer		Annual	
Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
23.5±14.84		62.5±13.20		33.25±9.54		39.75±20.30	

Brachionusangularis



Branchionusquadridentatus

Brachionusfalcatus

quality for various uses. The connection between the physico-chemical parameters such as pH, nitrate and phosphate and zooplankton was revealed by Das *et al.,* (1996). The availability of nutrient impacts on the richness of copepoda and rotifer (Kumar *et al.,* 2004). Sarkar and Chaudhuri (1999) had observed that the fluctuation of abiotic factors as temperature, pH, dissolved oxygen, phosphate, and nitrogen can influence the growth of zooplankton. Water temperature between 10–29 °C is suitable for zooplankton progression (Kaushik *et al.,* 1992). Zooplankton is an integral component of aquatic ecosystem and comprises of microscopic animal life that passively float of swim freely. Major components of zooplankton are represented by Protozoa, Rotifera, Cladocera and Copepoda. Zooplankton incorporates primary and partly secondary micro faunal consumer's operating system. This serves the functional role of harvesting primary production and grazing the bacterial biomass on the detrital spectrum in water (Seshgiri Rao 2005). *Branchionus* species showed dominance in rotifers. The presence of multiplicity of *Branchionus sp.,* are the estimate of stimulus of pollutants as well as domestic sewage discharges (Sharma and Mankodi 2011). Mahesh *et al.,* (2015) had observed rotifers population is recorded high in Kandlapallylake, Jagtial, Telangana. The rotifers are abundance at station S-1 during winter season was 477 No./L. due to favourable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus. Somani and Pejavar (2003) stated that Rotifera is quite a diverse group of organism and large generic variety is observed in various lentic environments all over India. Pande *et al.,* (2007) reported that Rotifera occurs more predominantly than Cladocerans and Copepodes. Edmondson (1965) observed that high Rotifer population in winter could be attributed with the favourable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus. Radwan (1980) stated that abiotic factors have a weak influence on the abundance and fertility of pelagic rotifers. According to Pennak (1989) the extensive growth of Potamogeton was said to inhibit the development of Rotifers.

Conclusion

Zooplanktonic study of Kolar river was done during the year 2011-2012 station 1 under four groups viz. Rotifera, Cladocera, Copepoda, and Ostracodabehind this Nauplius larvae in normal range. Rotifers were found to subsidize to the zooplankton abundance of the river accounting 13 species.The higher concentration of Rotifers was found during winter season and minimum during rainy season.

REFERENCES

Altaff K. 2004. A manual of zooplankton. University grants commission, New Delhi.

Aoyagui A. S. M. and Bonecker C. C. 2004. Rotifers in different environments of the Upper Parana river flood plain (Brazil): richness, abundance and the relationship to connectivity. Hydrobiologia, 522: 281-290.

Ayodele H. A. and Adeniyi I. F. 2006. The zooplankton fauna of six impoundments on the river Osun, Southern Nigeria. The Zoologist 1, (4): 49-67.

Bhora C. and Arvind Kumar, 2004. Plankton diversity in the wetland of Jharkhand. A.P.H. publishing corp, New Delhi, 91-123.

Contreras J. J., Sharma S. S. S., Merino-Ibarra M. and Nandini S. 2009. Seasonal changes in the rotifer (Rotifera) diversity from a tropical high altitude reservoir (Valle de Bravo, Mexico). J. Environ. Biol., (30): 191-195.

Das P. K., Micheal R. G., and Gupta A. Trop. Ecol.1996, 37, 257.

Dhanapathi M.V.S.S.S. 2000. Taxonomic notes on the Rotifiers from India. I AA B. Publication, Hyderabad.

Edmondson W. T. 1965. Freshwater biology: Efficiency of sampling effort. John Willey and Sons Inc. New York. Aqua.Res.

Kaushik S., Agarkar M. S. and Saxena D. N. 1992. Distribution of phytoplankton in riverine Waters in Chambal area, Madhya Pradesh. Bionature. (12): 1–7.

Kumar A. S., Tripathi G. and Ghosh P. (2004):Status of freshwater in 21st century A Review- in water pollution: Assessment and management, Kumar A and G Tripathi (Ed), DayaPubl. House, New Delhi.

Mahesh T., Balakrishna D., Reddy Surender K. and Reddy Ravinder T. 2015. A Study of zooplankton diversity and their seasonal variation in Kandlapallylake, Jagtial, Telangana. Das, P. K., Micheal, R. G., and Gupta, A. Trop. Ecol.1996, 37, 257.

Pandey, B.N., Ambasta O.P., Jha. A.K. and Shambhu K. 2007: Seasonal variation in physico-chemical and biological properties of river Panar (Bihar) Env. Cons. J. 8, (3): 133 - 153.

Radwan, S. 1980. The effect of some abiotic and biotic factors on the fertility of planktonic rotifer species. Hydrobiologia, 73:1-3.

Redmond W.A. 2008. Lead. Microsoft Encarta 2007 [DVD].

Sarkar S. K. and Chayudhari A. B. 1999. Limnlogical research in India, Ist Ed. DayaPublic.House Delhi.

Seshgiri Rao I. 2005. Zooplankton Limnology in the Indian subcontinent. Ukaaz Publication, Hyderabad: 209-227.

Sharma K. N. and Mankodi P. C. (2011):Study on plankton diversity of Narmada River, Gujarat, J. Curr. Sci., Vol. 16, (1): 111-116.

Somani V. and Pejavar M. (2003):Rotifer diversity in Lake Masunda, Thane (Maharashtra) J. Aqua. Biol. 18, (1): 23-27.

Webber M. M., Edward E., Cambell C. and Webber D. (2005): Phytoplankton and zooplankton as indicator of water equality in Discovery bay, Jamaica. Hydrobiol.,545: 177-193.

Welch P. S. 1948. In: Limnological Methode (Blackston Co, Philadelphia) 381.

****